
Santa Cruz Active Management Area

Public Comments on proposed Assured Water Supply Rules

Topic	Commenter	Comment
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Effluent

Lee Storey, Ballard Spahr Andrews & Ingersoll, LLP

- The effluent exclusion must be removed. the Department's model report indicated that many factors influence the Santa Cruz River, including effluent from NIWTP. This is compounded by the effluent's support of the riparian demands.
- The commentator has concerns that the rules seek to define a "local area" of the Santa Cruz River in order to maintain stream flow that is dependant upon the discharge of the Nogales International Wastewater Treatment Plat (NIWTP). The commentator expresses concerns that this particular section of the river is differentiated for the purposes of protecting stream flows and the associated riparian areas.
- The 10% deviation does not reflect the 30-year history of effluent discharge into the Santa Cruz River.
- The proposed rules allocate a water right to riparian uses. Further, the removal of the effluent supply for assured water supply purposes and allowing the riparian areas to obtain a water right double dips into the supply available for assured water supply purposes. Riparian uses cannot be allocated a water right.
- The effluent exclusion must be removed. The commentator observes a contradiction within the rule where the applicant is directed to evaluate the unique aquifer conditions of the AMA, and yet the proposed rule discounts the existence of the effluent in the system, unless it is legally available. The exclusion of effluent will falsify the hydrologic processes of the system.
- The measured water level data presumably includes inflow of effluent from the NIWTP. The rules as drafted require applicants to exclude effluent when seeking to prove up an assured water supply. This creates an artificial standard deviation that is not supported by the historical record.

Mark Larkin, Crebbs Family

- As you know, Nogales, Sonora contributes 9.9 mgd (15.34 cfs; 30.39 ac-ft/day) to the Nogales International Wastewater Treatment Plant (NIWWTP). About 9 mgd (13.95 cfs; 27.63 ac-ft/day) of this is released into the stream of the Santa Cruz River as treated effluent. A large amount of riparian vegetation has grown up around this effluent stream. This vegetation has an annual consumptive use of 25,800 ac-ft, according to the Department's Third Management Plan SCAMA water budget. It is unfair for the Department to count the consumptive use of the riparian vegetation without considering the contribution of the Mexican effluent.
- Using aerial photos, we should try to establish what might be a natural (pre-effluent) baseline for the riparian woodland. That naturally occurring woodland should be accounted for in the water consumption of the basin. The consumption above that baseline by a woodland that was created and nurtured by the Mexican effluent should not be counted against the water budget of SCAMA for purposes of Assured Water Supply analyses.

Michael Kafka, Riley Carlock & Applewhite

- It is the commentator's understanding that the rationale for precluding the model simulations to include any effluent discharged into the Santa Cruz river from a wastewater treatment plan unless the effluent is legally available to the applicant and not committed to another use is that without some kind of binding contract with the Mexican government, effluent discharges from the Nogales International Wastewater Treatment Plan could be stopped at any time, making the effluent unavailable. The commentator believes that this is overly conservative, and that the model simulations should take into account anticipated aquifer conditions resulting from discharges of effluent into the system for at least some reasonable period of time to account for the fact that effluent is actually being discharged into the system.

Topic	Commenter	Comment
Effluent		
	<i>Sonoran Institute</i>	<ul style="list-style-type: none"> ● The use of both pre- and post-effluent water levels has two important consequences. Generally the depth to static water level is deeper and the standard deviation is generally artificially inflated beyond the value that would be associated with either a pre- or post-effluent data set. This greater standard deviation also deepens the regulatory water table threshold significantly beyond what would be expected from use of either a pre- or post effluent data set in isolation. ● The rules disincentivize the acquisition of effluent from the NIWTP, either as necessary to maintain the existing riparian areas or simply to sustain existing water uses, since the rules allow new proposed uses to effectively "borrow" against this effluent buffer without incurring any obligation to secure it. ● A new proposed withdrawal would be allowed to reduce depth-to-static water levels to nearly the lowest levels observed in the pre-effluent period... in essence this would allow a new withdrawal to commit essentially the entire stored volume of effluent-generated groundwater in the aquifer prior to triggering regulatory compliance. ● R12-15-716(E)(1) Rules language related to the restriction on using effluent in groundwater model projection simulations should be expanded to specifically reference NIWTP effluent, and that effluent contribution should be backed out from model simulations. Additionally, guidance should be provided on how this should be done in model simulations. ● To the extent that effluent contributions cannot be disentangled from existing water level data, reliance on water level simulations is clearly not adequate to ensure proposed new uses will in fact prevent long-term declines in accordance with management goals. Applicants should also show that new uses can actually be accommodated within a reasonably available water budget for each microbasin. ● Use of pre- and post-effluent water levels creates much larger acceptable variations from current levels than would be expected using either dataset in isolation. The habitat concerns created by this methodology are exacerbated by the fact that deviations even below the standard deviation are permitted for periods up to 12 consecutive months or 10% on the months in a series of simulations. The proposed rule stretches any reasonable interpretation of what constitutes "prevention of long-term declines." ● The rules are not clear on how the contributions of effluent are to be accounted for in the modeling to ensure that new withdrawals are not relying on effluent contributions to the system. ● It is critical to note that the NIWTP effluent has effectively mitigated the decreases in groundwater discharge and water table elevations in the Younger Alluvium that would likely have occurred as a result of pumping in SCAMA...Since current groundwater development would likely have eliminated most of the Santa Cruz River Riparian habitat in the absence of the NIWTP, the Sonoran Institute believes that the effluent generated by the NIWTP may ultimately represent the best source of water supply to provide for the future needs of the riparian corridor on the Santa Cruz River...the effect of effluent to the Santa Cruz system has been almost without exception, a positive trend in depth-to-static water levels (particularly in areas near the Santa Cruz River below the NIWTP). ● Streamflow records from periods prior to the construction of the WWTP indicate perennial flow had essentially been eliminated in the effluent-dominated sections of the river by the mid-1970s.

Topic	Commenter	Comment
Exceedance Level		

Jim Davis, Errol L. Montgomery & Associates

- One standard deviation in water level may not be the appropriate way to determine acceptability of groundwater impact. Areas with larger fluctuation, such as those near the river and areas of heavy pumping would allow more impact.

Lee Storey, Ballard Spahr Andrews & Ingersoll, LLP

- A 10% deviation does not equate to a "long term" decline.
- Does the use of the standard deviation take into account the growing demand of the riparian habitat, as well as the existing historical demands? Is this a policy decision by the Department to keep the water tables artificially high in order to protect the riparian habitat at the expense of historic uses?
- The 10% deviation does not reflect the 30-year history of effluent discharge into the Santa Cruz River.
- The commentator suggests a deviation of more than 50% should be considered long-term.
- The standard deviation is a data tool and should not be used to measure the hydrologic conditions. This tool is acceptable as a measure of the available data, but should not be used due to the lack of data. There should be at least 30 years of data to support the use of such a data tool. The use of this method is an arbitrary measure of the proposed use vs. the goal of the AMA.
- The commentator observes that the allowable exceedance beyond one standard deviation is 10% of the total runs of the model. The Commentator further observes that this results in the proposed rule requiring proof of a non-consecutive 1,000-year assured water supply.

Sonoran Institute

- R12-15-716(E)(3)(a) The one standard deviation below the historic average will allow deviations that are in excess of the AMA management goal. Additionally allowing deviations of up to 12 consecutive months or 10% of the months in a simulation could have drastic impacts on riparian areas.
- Use of pre- and post-effluent water levels creates much larger acceptable variations from current levels than would be expected using either dataset in isolation. The habitat concerns created by this methodology are exacerbated by the fact that deviations even below the standard deviation are permitted for periods up to 12 consecutive months or 10% on the months in a series of simulations. The proposed rule stretches any reasonable interpretation of what constitutes "prevention of long-term declines."
- A new proposed withdrawal would be allowed to reduce depth-to-static water levels to nearly the lowest levels observed in the pre-effluent period... in essence this would allow a new withdrawal to commit essentially the entire stored volume of effluent-generated groundwater in the aquifer prior to triggering regulatory compliance.
- The allowable variation in static water levels is too large. Research demonstrates that significant interruptions in groundwater supply, i.e., more than 2-3 months, will stress and eventually extirpate riparian vegetation. Unfortunately the proposed points of regulatory compliance will not prevent this from occurring.
- The use of both pre- and post-effluent water levels has two important consequences. Generally the depth to static water level is deeper and the standard deviation is generally artificially inflated beyond the value that would be associated with either a pre- or post-effluent data set. This greater standard deviation also deepens the regulatory water table threshold significantly beyond what would be expected from use of either a pre- or post effluent data set in isolation.

Topic	Commenter	Comment
General Comments		
	<i>Carlos Ronstadt, Snell & Wilmer</i>	<ul style="list-style-type: none"> ● A portion of the SCAMA goal is prevention of local water tables from experiencing long-term declines. SCAMA was created out of the Tucson AMA 13 years ago. Since that time water levels in the AMA have remained stable. There is no need to adopt the rules at this time. To do so may expose the Department to Proposition 207 claims, as it may seriously impact the right to develop real property within SCAMA or, in the case of Baca Float Water Company, adversely affect its ability to deliver water within its CC&N.
	<i>Hough Holub, Attorney at Law</i>	<ul style="list-style-type: none"> ● Generally supportive. The commentator cautions that when the Legislature created the AMA they wanted a conjunctive management of the surface water and groundwater systems, but the Legislature did not create a new surface water management legal system. The commentator also observes that surface water rights have both a relative priority (some are senior some are junior) and do not necessarily correlate to the actual physical availability, which can fluctuate based upon actual flows, dependant upon rainfall. The commentator asks how to deal with the variable supply of surface water for assured water supply purposes, and suggests that the 'extra' surface water right that might exist in a right that does not meet assured water supply standards be voluntarily transferred to third party instream right holders such as State Parks, or conservation entities like trusts, National Park Service, etc.
	<i>Lee Storey, Ballard Spahr Andrews & Ingersoll, LLP</i>	<ul style="list-style-type: none"> ● Initial general comment summarizing the management goal of the AMA, the intent behind the authorizing statute creating the AMA, and the generic hydrologic condition of the AMA. However, the commentator believes that the rules as proposed are not aligned with the statutory intent of the creation of the AMA. ● The commentator observes that the rules as proposed would force the conversion of agricultural water uses to municipal and industrial uses. The commentator also observes that these existing agricultural uses are currently accounted for in the model and that conversion of these uses would not constitute a new or increased demand in the AMA. The commentator suggests that the Department presumptively approve the historical agricultural water use for assured water supply as being physically, legally and continuously available.
	<i>Marshall Magruder, Citizen in SCAMA</i>	<ul style="list-style-type: none"> ● Supportive; No other issue is more important to the Santa Cruz River. Found the process to be fair and scientifically sound. Recommends adoption of the rules. Appreciates development of the AMA model by the Department, and recommends use of the model by AWS applicants. One question identified: The Department needs to ensure that if applicants are not using the the Department's model, that the model used to support the AWS application is of sound construction and uses appropriate statistical data.
	<i>Nancy Bohman, Citizen in SCAMA</i>	<ul style="list-style-type: none"> ● The commentator supports the adoption of the proposed rules in order to maintain safe-yield and prevent the local water tables from experiencing long term declines.
	<i>Sherry Sass, Friends of the Santa Cruz River</i>	<ul style="list-style-type: none"> ● Supportive of the rules as proposed. The rules recognize the groundwater and surface water interaction in the AMA, riparian demand and provides for proper drought response. The commenter did raise concern that a dual right holder in the AMA may be able to separate those rights and essentially "double dip" increasing the demands and out stripping supplies.
	<i>Sonoran Institute</i>	

Topic	Commenter	Comment
General Comments		

Sonoran Institute

- Because the Department has not included maps delineating boundaries of various well groupings, the Sonoran Institute was unable to ascertain which areas would be of greatest concern.
- The mission statement for SCAMA embraces the management of water to ensure a reliable water supply while "protecting the aquatic and riparian habitat" and "sustaining a healthy economy." These objectives are complementary with the attainment of the SCAMA management goal, which seeks to "[maintain] safe-yield conditions to prevent local water tables from experiencing long-term declines."
- R12-15-728(B)(1-2) These provisions are inadequate to protect static water levels in the floodplain aquifer and are inconsistent with the AMA goal.
- The Sonoran Institute suggests that there appears to be a real question as to whether additional water (beyond that based on effluent recharge) is in fact reliably available in some micro-basins along the Santa Cruz.

Topic	Commenter	Comment
Historic Water Levels		

Carlos Ronstadt, Snell & Wilmer

- The commentator notes that the Department has recognized the fact that the existing water level data may not represent the true average water level for all areas of the AMA. The commentator states that there is not enough data to use the statistical method, and that the Department should wait to implement the rules until at least 30 years of data are available.
- Local well uses impact local fluctuations in nearby wells. This is not how the AMA should be managed.
- The commentator notes that the Department has recognized that the data used in the model (available water level data) have a sampling bias, inasmuch as the data points were not randomly sampled. The commentator concludes that the data cannot be used in a statistically valid manner.

Jim Davis, Errol L. Montgomery & Associates

- The definition for water level monitoring location seems unnecessarily restrictive to the Department's and USGS' data. The rules should allow for the use of other data sources such as other government agencies, private water companies etc. The rules should allow for the addition of supplemental data.

Lee Storey, Ballard Spahr Andrews & Ingersoll, LLP

- The standard deviation is a data tool and should not be used to measure the hydrologic conditions. This tool is acceptable as a measure of the available data, but should not be used due to the lack of data. There should be at least 30 years of data to support the use of such a data tool. The use of this method is an arbitrary measure of the proposed use vs. the goal of the AMA.
- The measured water level data presumably includes inflow of effluent from the NIWTP. The rules as drafted require applicants to exclude effluent when seeking to prove up an assured water supply. This creates an artificial standard deviation that is not supported by the historical record.
- Does the use of the standard deviation take into account the growing demand of the riparian habitat, as well as the existing historical demands? Is this a policy decision by the Department to keep the water tables artificially high in order to protect the riparian habitat at the expense of historic uses?
- The commentator observes that the rules as proposed would force the conversion of agricultural water uses to municipal and industrial uses. The commentator also observes that these existing agricultural uses are currently accounted for in the model and that conversion of these uses would not constitute a new or increased demand in the AMA. The commentator suggests that the Department presumptively approve the historical agricultural water use for assured water supply as being physically, legally and continuously available.
- The commentator raised several concerns regarding the use of the historic water level data, specifically, the lack of data available to the Department. In addition, the available data may be sparsely or infrequently collected.

Mark Larkin, Crebbs Family

- Using aerial photos, we should try to establish what might be a natural (pre-effluent) baseline for the riparian woodland. That naturally occurring woodland should be accounted for in the water consumption of the basin. The consumption above that baseline by a woodland that was created and nurtured by the Mexican effluent should not be counted against the water budget of SCAMA for purposes of Assured Water Supply analyses.

Sonoran Institute

- Because the Department has not included maps delineating boundaries of various well groupings, the Sonoran Institute was unable to ascertain which areas would be of greatest concern.

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Historic Water Levels		

Sonoran Institute

- To the extent that effluent contributions cannot be disentangled from existing water level data, reliance on water level simulations is clearly not adequate to ensure proposed new uses will in fact prevent long-term declines in accordance with management goals. Applicants should also show that new uses can actually be accommodated within a reasonably available water budget for each microbasin.
- Streamflow records from periods prior to the construction of the WWTP indicate perennial flow had essentially been eliminated in the effluent-dominated sections of the river by the mid-1970s.
- It is critical to note that the NIWTP effluent has effectively mitigated the decreases in groundwater discharge and water table elevations in the Younger Alluvium that would likely have occurred as a result of pumping in SCAMA...Since current groundwater development would likely have eliminated most of the Santa Cruz River Riparian habitat in the absence of the NIWTP, the Sonoran Institute believes that the effluent generated by the NIWTP may ultimately represent the best source of water supply to provide for the future needs of the riparian corridor on the Santa Cruz River...the effect of effluent to the Santa Cruz system has been almost without exception, a positive trend in depth-to-static water levels (particularly in areas near the Santa Cruz River below the NIWTP).
- A quick survey demonstrates that even the Department's proposed average historic depth-to-static water would be insufficient to prevent deterioration of some riparian areas.
- Group 13 average depth to water should be 45 feet.
- Further refinement of the model in regard to being able to distinguish riparian areas, ET rates and relationships between groundwater levels in the floodplain aquifer is recommended.
- It would be helpful to have a number of monitoring wells instrumented with continuous recording devices to monitor on a daily or hourly basis. It would also be helpful to install monitor wells in riparian areas to improve model accuracy and resolution, in regard to likely impacts of withdrawals in the Santa Cruz River riparian corridor.

Topic	Commenter	Comment
Language		
	<i>Carlos Ronstadt, Snell & Wilmer</i>	<ul style="list-style-type: none"> The proposed rule will require a complex statistical analysis referred in the draft language as "stochastic modeling technique." This term is not defined within the rule.
	<i>Lee Storey, Ballard Spahr Andrews & Ingersoll, LLP</i>	<ul style="list-style-type: none"> The rules should specifically define: <ol style="list-style-type: none"> 1. Areas of local water tables if they are different throughout the AMA 2. What is meant by long-term decline 3. What is the extent of the area of hydrologic impact. The commentator is confused by the definition of "projected net monthly groundwater discharge." It is unclear how applicants can determine net monthly discharge when sources of water are not distinguished as surface water or groundwater in the proposed rules. The commentator expressed concerns that by requiring the multiple runs of the 100-year model simulation, the Department is requiring the proof of a 10,000 year assured water supply (100 runs of a 100-year model), thus exceeding the assured water supply requirement as outlined under statute. The commentator observes that the proposed rules indirectly define a portion of the goal (prevention of long term declines in the local water tables) and local water tables. The commentator believes separate defined terms are needed for these terms in the rule. The commentator observes that the rules as proposed would force the conversion of agricultural water uses to municipal and industrial uses. The commentator also observes that these existing agricultural uses are currently accounted for in the model and that conversion of these uses would not constitute a new or increased demand in the AMA. The commentator suggests that the Department presumptively approve the historical agricultural water use for assured water supply as being physically, legally and continuously available. The commentator observes that the allowable exceedence beyond one standard deviation is 10% of the total runs of the model. The Commentator further observes that this results in the proposed rule requiring proof of a non-consecutive 1,000-year assured water supply.
	<i>Michael Kafka, Riley Carlock & Applewhite</i>	<ul style="list-style-type: none"> The commentator suggests adding the following language to R12-15-716(E)(1)(g): "If the Director determines that changes will likely occur in the riparian demands or aquifer conditions, the model simulations shall take those changes into account." R12-15-716(E)(1)(g) accounting for existing riparian demands. The commentator suggests language to prevent the double counting of this demand if it is already accounted for under other provisions in R12-15-716(E)(1). R12-15-716(E)(1)(a) and (b) include the following language: "If the Director determines that changes will likely occur in the pumping patterns or aquifer conditions, the model simulations shall take those changes into account." The commentator interprets this language to mean that the Department will consider not only declines in the aquifer resulting from increased pumping, but also increases in water levels that may occur as a result of decreased demand. The commentator suggests language to clarify that meaning.
	<i>Sonoran Institute</i>	<ul style="list-style-type: none"> R12-15-716(E)(3)(b) does not ensure that groundwater discharge will continue at anywhere near current levels, since it only requires models to demonstrate that discharges are greater than zero, and only requires models to demonstrate that this state be demonstrated in one month out of the last 10 years of the projection period, and in only 90% of the modeled scenarios. This does not function to protect current groundwater discharges to the floodplain aquifer, and is fundamentally inconsistent with the SCAMA management goal.

Topic	Commenter	Comment
Language		

Sonoran Institute

- R12-15-716(E) Shouldn't the Department provide for the use of the Department's model unless the applicant can demonstrate that another model provides more accurate and/or precise demonstration of impacts on depth-to-water?
- R12-15-728(B)(1-2) These provisions are inadequate to protect static water levels in the floodplain aquifer and are inconsistent with the AMA goal.
- R12-15-717(H)(1) The Department has not provided criteria for defining drought conditions.
- R12-15-716(E)(1) Rules language related to the restriction on using effluent in groundwater model projection simulations should be expanded to specifically reference NIWTP effluent, and that effluent contribution should be backed out from model simulations. Additionally, guidance should be provided on how this should be done in model simulations.
- R12-15-716(E)(1)(g) There should be a firm target set for riparian demand established that is sufficiently conservative to account for the potential impacts of drought conditions.
- R12-15-716(E)(3)(a) The one standard deviation below the historic average will allow deviations that are in excess of the AMA management goal. Additionally allowing deviations of up to 12 consecutive months or 10% of the months in a simulation could have drastic impacts on riparian areas.
- The mission statement for SCAMA embraces the management of water to ensure a reliable water supply while "protecting the aquatic and riparian habitat" and "sustaining a healthy economy." These objectives are complementary with the attainment of the SCAMA management goal, which seeks to "[maintain] safe-yield conditions to prevent local water tables from experiencing long-term declines."

Management Goal

Carlos Ronstadt, Snell & Wilmer

- There needs to be a clear mechanism for property owners with appurtenant surface water rights to extinguish those rights and allow the use of an extinguishment credit to support development.
- Local well uses impact local fluctuations in nearby wells. This is not how the AMA should be managed.
- A portion of the SCAMA goal is prevention of local water tables from experiencing long-term declines. SCAMA was created out of the Tucson AMA 13 years ago. Since that time water levels in the AMA have remained stable. There is no need to adopt the rules at this time. To do so may expose the Department to Proposition 207 claims, as it may seriously impact the right to develop real property within SCAMA or, in the case of Baca Float Water Company, adversely affect its ability to deliver water within its CC&N.

Lee Storey, Ballard Spahr Andrews & Ingersoll, LLP

- The commentator has concerns that the rules seek to define a "local area" of the Santa Cruz River in order to maintain stream flow that is dependant upon the discharge of the Nogales International Wastewater Treatment Plat (NIWTP). The commentator expresses concerns that this particular section of the river is differentiated for the purposes of protecting stream flows and the associated riparian areas.
- The commentator observes that the rules as proposed would force the conversion of agricultural water uses to municipal and industrial uses. The commentator also observes that these existing agricultural uses are currently accounted for in the model and that conversion of these uses would not constitute a new or increased demand in the AMA. The commentator suggests that the Department presumptively approve the historical agricultural water use for assured water supply as being physically, legally and continuously available.
- The commentator suggests a deviation of more than 50% should be considered long-term.
- The rules should specifically define:
 1. Areas of local water tables if they are different throughout the AMA
 2. What is meant by long-term decline
 3. What is the extent of the area of hydrologic impact.
- The commentator observes that the proposed rules indirectly define a portion of the goal (prevention of long term declines in the local water tables) and local water tables. The commentator believes separate defined terms are needed for these terms in the rule.
- Initial general comment summarizing the management goal of the AMA, the intent behind the authorizing statute creating the AMA, and the generic hydrologic condition of the AMA. However, the commentator believes that the rules as proposed are not aligned with the statutory intent of the creation of the AMA.
- A 10% deviation does not equate to a "long term" decline.
- The rules should recognize the fundamental right of surface water users to use the entire entitlement of a priority basis. The commentator believes the rules as drafted are contrary to the SCAMA enabling statutes in that the draft rules modify the fundamental characteristics of surface water rights in the AMA. The commentator believes the AWS rules cannot prevent or limit the use of surface water rights by implementation of the goal of the active management area.
- The Commentator questions the development of the model, how the standards were developed by the Department and how these relate to the dual goal of the AMA of maintaining safe-yield and preventing long-term declines of the local water tables.

Management Goal

Lee Storey, Ballard Spahr Andrews & Ingersoll, LLP

- The standard deviation is a data tool and should not be used to measure the hydrologic conditions. This tool is acceptable as a measure of the available data, but should not be used due to the lack of data. There should be at least 30 years of data to support the use of such a data tool. The use of this method is an arbitrary measure of the proposed use vs. the goal of the AMA.
- The commentator observes that hydrologic fluctuations do occur in the system, and that these fluctuations may be of durations longer than one year. The commentator questions how these multi-year fluctuations are reflected in the model. The commentator suggests that the Department make a determination of what "long-term" is so that it does not limit the use of surface water rights that are converted to assured water supply purposes.

Sonoran Institute

- R12-15-716(E)(3)(a) The one standard deviation below the historic average will allow deviations that are in excess of the AMA management goal. Additionally allowing deviations of up to 12 consecutive months or 10% of the months in a simulation could have drastic impacts on riparian areas.
- To the extent that effluent contributions cannot be disentangled from existing water level data, reliance on water level simulations is clearly not adequate to ensure proposed new uses will in fact prevent long-term declines in accordance with management goals. Applicants should also show that new uses can actually be accommodated within a reasonably available water budget for each microbasin.
- Use of pre- and post-effluent water levels creates much larger acceptable variations from current levels than would be expected using either dataset in isolation. The habitat concerns created by this methodology are exacerbated by the fact that deviations even below the standard deviation are permitted for periods up to 12 consecutive months or 10% on the months in a series of simulations. The proposed rule stretches any reasonable interpretation of what constitutes "prevention of long-term declines."
- The Sonoran Institute suggests that there appears to be a real question as to whether additional water (beyond that based on effluent recharge) is in fact reliably available in some micro-basins along the Santa Cruz.
- R12-15-728(B)(1-2) These provisions are inadequate to protect static water levels in the floodplain aquifer and are inconsistent with the AMA goal.
- R12-15-716(E)(3)(b) does not ensure that groundwater discharge will continue at anywhere near current levels, since it only requires models to demonstrate that discharges are greater than zero, and only requires models to demonstrate that this state be demonstrated in one month out of the last 10 years of the projection period, and in only 90% of the modeled scenarios. This does not function to protect current groundwater discharges to the floodplain aquifer, and is fundamentally inconsistent with the SCAMA management goal.
- The mission statement for SCAMA embraces the management of water to ensure a reliable water supply while "protecting the aquatic and riparian habitat" and "sustaining a healthy economy." These objectives are complementary with the attainment of the SCAMA management goal, which seeks to "[maintain] safe-yield conditions to prevent local water tables from experiencing long-term declines."

Models: ADWR

Carlos Ronstadt, Snell & Wilmer

- The Department has yet to explain whether the proposed modeling technique will work. The commentator suggests conducting trial runs of the model to determine if there are areas within the AMA with a surplus of water.
- The commentator notes that the Department has recognized the fact that the existing water level data may not represent the true average water level for all areas of the AMA. The commentator states that there is not enough data to use the statistical method, and that the Department should wait to implement the rules until at least 30 years of data are available.
- The commentator notes that the Department has recognized that the data used in the model (available water level data) have a sampling bias, inasmuch as the data points were not randomly sampled. The commentator concludes that the data cannot be used in a statistically valid manner.
- The Commentator perceives flaws in the modeling. As such the model should not be used. No other area in the state relies upon such a model, and standard numerical modeling should be used.
- While the model has been constructed the commentator does not feel that the model completely captures the interaction of natural recharge and streambed or alluvial flow in the AMA. The commentator feels insufficient scientific basis to adopt rules at this time
- Inclusion of riparian demand in rule is not warranted. Riparian areas do not "own" water rights and should not be included. Fluctuations in demand based upon varying growth will not allow quantification of demand.
- The Commentator implies that the use of numerical models such as MODFLOW are scientifically valid due to a greater volume of documentation while the modeling method of Poisson stochastic process used by the Department is somehow less valid due to less available documentation.
- The Department model is limited to the inner valley area. It is unclear if the rules would apply outside of the modeled area.

Jim Davis, Errol L. Montgomery & Associates

- The definition for water level monitoring location seems unnecessarily restrictive to the Department's and USGS' data. The rules should allow for the use of other data sources such as other government agencies, private water companies etc. The rules should allow for the addition of supplemental data.
- Requiring 100 model simulations seems excessive.
- The commentator expressed concerns that the Department would not allow the use of the Department's model. It would be prohibitively expensive for each potential AWS applicant to develop their own independent model. Further confusion could also be generated by the use of two or more competing models with varying results.

Lee Storey, Ballard Spahr Andrews & Ingersoll, LLP

- The effluent exclusion must be removed. the Department's model report indicated that many factors influence the Santa Cruz River, including effluent from NIWTP. This is compounded by the effluent's support of the riparian demands.
- The commentator expressed concerns that by requiring the multiple runs of the 100-year model simulation, the Department is requiring the proof of a 10,000 year assured water supply (100 runs of a 100-year model), thus exceeding the assured water supply requirement as outlined under statute.
- The Commentator questions the development of the model, how the standards were developed by the Department and how these relate to the dual goal of the AMA of maintaining safe-yield and preventing long-term declines of the local water tables.

Models: ADWR

Lee Storey, Ballard Spahr Andrews & Ingersoll, LLP

- The proposed rules allocate a water right to riparian uses. Further, the removal of the effluent supply for assured water supply purposes and allowing the riparian areas to obtain a water right double dips into the supply available for assured water supply purposes. Riparian uses cannot be allocated a water right.
- The commentator requests that The Department develop a steady state or numeric model and use that model to evaluate the proposed modeling technique and evaluation methodology.

Sonoran Institute

- It would be helpful to have a number of monitoring wells instrumented with continuous recording devices to monitor on a daily or hourly basis. It would also be helpful to install monitor wells in riparian areas to improve model accuracy and resolution, in regard to likely impacts of withdrawals in the Santa Cruz River riparian corridor.
- Because the Department has not included maps delineating boundaries of various well groupings, the Sonoran Institute was unable to ascertain which areas would be of greatest concern.
- Further refinement of the model in regard to being able to distinguish riparian areas, ET rates and relationships between groundwater levels in the floodplain aquifer is recommended.
- To the extent that effluent contributions cannot be disentangled from existing water level data, reliance on water level simulations is clearly not adequate to ensure proposed new uses will in fact prevent long-term declines in accordance with management goals. Applicants should also show that new uses can actually be accommodated within a reasonably available water budget for each microbasin.
- The rules are not clear on how the contributions of effluent are to be accounted for in the modeling to ensure that new withdrawals are not relying on effluent contributions to the system.
- The model does not address the locations of groundwater discharges in the Younger Alluvium. It is our understanding that the Department has in fact prepared this information but chooses to not release it at this time. At a minimum it would be helpful to prepare a groundwater contour map.
- R12-15-716(E) Shouldn't the Department provide for the use of the Department's model unless the applicant can demonstrate that another model provides more accurate and/or precise demonstration of impacts on depth-to-water?
- R12-15-716(E)(1) Rules language related to the restriction on using effluent in groundwater model projection simulations should be expanded to specifically reference NIWTP effluent, and that effluent contribution should be backed out from model simulations. Additionally, guidance should be provided on how this should be done in model simulations.
- Group 13 average depth to water should be 45 feet.

Topic	Commenter	Comment
Models: Applicants'		

Carlos Ronstadt, Snell & Wilmer

- The Department model is limited to the inner valley area. It is unclear if the rules would apply outside of the modeled area.
- The proposed rule will require a complex statistical analysis referred in the draft language as "stochastic modeling technique." This term is not defined within the rule.
- The Commentator implies that the use of numerical models such as MODFLOW are scientifically valid due to a greater volume of documentation while the modeling method of Poisson stochastic process used by the Department is somehow less valid due to less available documentation.

Jim Davis, Errol L. Montgomery & Associates

- Requiring 100 model simulations seems excessive.
- The commentator expressed concerns that the Department would not allow the use of the Department's model. It would be prohibitively expensive for each potential AWS applicant to develop their own independent model. Further confusion could also be generated by the use of two or more competing models with varying results.

Lee Storey, Ballard Spahr Andrews & Ingersoll, LLP

- The commentator expressed concerns that by requiring the multiple runs of the 100-year model simulation, the Department is requiring the proof of a 10,000 year assured water supply (100 runs of a 100-year model), thus exceeding the assured water supply requirement as outlined under statute.

Marshall Magruder, Citizen in SCAMA

- Supportive; No other issue is more important to the Santa Cruz River. Found the process to be fair and scientifically sound. Recommends adoption of the rules. Appreciates development of the AMA model by the Department, and recommends use of the model by AWS applicants. One question identified: The Department needs to ensure that if applicants are not using the the Department's model, that the model used to support the AWS application is of sound construction and uses appropriate statistical data.

Sonoran Institute

- The rules are not clear on how the contributions of effluent are to be accounted for in the modeling to ensure that new withdrawals are not relying on effluent contributions to the system.
- R12-15-716(E)(1) Rules language related to the restriction on using effluent in groundwater model projection simulations should be expanded to specifically reference NIWTP effluent, and that effluent contribution should be backed out from model simulations. Additionally, guidance should be provided on how this should be done in model simulations.
- R12-15-716(E) Shouldn't the Department provide for the use of the Department's model unless the applicant can demonstrate that another model provides more accurate and/or precise demonstration of impacts on depth-to-water?

Topic	Commenter	Comment
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Natural Recharge

Carlos Ronstadt, Snell & Wilmer

- While the model has been constructed the commentator does not feel that the model completely captures the interaction of natural recharge and streambed or alluvial flow in the AMA. The commentator feels insufficient scientific basis to adopt rules at this time

Riparian Demand

Carlos Ronstadt, Snell & Wilmer

- Inclusion of riparian demand in rule is not warranted. Riparian areas do not "own" water rights and should not be included. Fluctuations in demand based upon varying growth will not allow quantification of demand.

Lee Storey, Ballard Spahr Andrews & Ingersoll, LLP

- The proposed rules allocate a water right to riparian uses. Further, the removal of the effluent supply for assured water supply purposes and allowing the riparian areas to obtain a water right double dips into the supply available for assured water supply purposes. Riparian uses cannot be allocated a water right.
- The effluent exclusion must be removed. the Department's model report indicated that many factors influence the Santa Cruz River, including effluent from NIWTP. This is compounded by the effluent's support of the riparian demands.
- The commentator has concerns that the rules seek to define a "local area" of the Santa Cruz River in order to maintain stream flow that is dependant upon the discharge of the Nogales International Wastewater Treatment Plat (NIWTP). The commentator expresses concerns that this particular section of the river is differentiated for the purposes of protecting stream flows and the associated riparian areas.
- Does the use of the standard deviation take into account the growing demand of the riparian habitat, as well as the existing historical demands? Is this a policy decision by the Department to keep the water tables artificially high in order to protect the riparian habitat at the expense of historic uses?

Mark Larkin, Crebbs Family

- As you know, Nogales, Sonora contributes 9.9 mgd (15.34 cfs; 30.39 ac-ft/day) to the Nogales International Wastewater Treatment Plant (NIWWTP). About 9 mgd (13.95 cfs; 27.63 ac-ft/day) of this is released into the stream of the Santa Cruz River as treated effluent. A large amount of riparian vegetation has grown up around this effluent stream. This vegetation has an annual consumptive use of 25,800 ac-ft, according to the Department's Third Management Plan SCAMA water budget. It is unfair for the Department to count the consumptive use of the riparian vegetation without considering the contribution of the Mexican effluent.
- Using aerial photos, we should try to establish what might be a natural (pre-effluent) baseline for the riparian woodland. That naturally occurring woodland should be accounted for in the water consumption of the basin. The consumption above that baseline by a woodland that was created and nurtured by the Mexican effluent should not be counted against the water budget of SCAMA for purposes of Assured Water Supply analyses.

Michael Kafka, Riley Carlock & Applewhite

- R12-15-716(E)(1)(g) accounting for existing riparian demands. The commentator suggests language to prevent the double counting of this demand if it is already accounted for under other provisions in R12-15-716(E)(1).
- The commentator suggests adding the following language to R12-15-716(E)(1)(g): "If the Director determines that changes will likely occur in the riparian demands or aquifer conditions, the model simulations shall take those changes into account."

Sherry Sass, Friends of the Santa Cruz River

- Supportive of the rules as proposed. The rules recognize the groundwater and surface water interaction in the AMA, riparian demand and provides for proper drought response. The commenter did raise concern that a dual right holder in the AMA may be able to separate those rights and essentially "double dip" increasing the demands and out stripping supplies.

Sonoran Institute

Riparian Demand

Sonoran Institute

- To the extent that effluent contributions cannot be disentangled from existing water level data, reliance on water level simulations is clearly not adequate to ensure proposed new uses will in fact prevent long-term declines in accordance with management goals. Applicants should also show that new uses can actually be accommodated within a reasonably available water budget for each microbasin.
- Use of pre- and post-effluent water levels creates much larger acceptable variations from current levels than would be expected using either dataset in isolation. The habitat concerns created by this methodology are exacerbated by the fact that deviations even below the standard deviation are permitted for periods up to 12 consecutive months or 10% on the months in a series of simulations. The proposed rule stretches any reasonable interpretation of what constitutes "prevention of long-term declines."
- It is critical to note that the NIWTP effluent has effectively mitigated the decreases in groundwater discharge and water table elevations in the Younger Alluvium that would likely have occurred as a result of pumping in SCAMA...Since current groundwater development would likely have eliminated most of the Santa Cruz River Riparian habitat in the absence of the NIWTP, the Sonoran Institute believes that the effluent generated by the NIWTP may ultimately represent the best source of water supply to provide for the future needs of the riparian corridor on the Santa Cruz River...the effect of effluent to the Santa Cruz system has been almost without exception, a positive trend in depth-to-static water levels (particularly in areas near the Santa Cruz River below the NIWTP).
- R12-15-716(E)(1)(g) There should be a firm target set for riparian demand established that is sufficiently conservative to account for the potential impacts of drought conditions.
- Approximately 35% of the riparian supply appears to result from local groundwater discharges and surface flows.
- The mission statement for SCAMA embraces the management of water to ensure a reliable water supply while "protecting the aquatic and riparian habitat" and "sustaining a healthy economy." These objectives are complementary with the attainment of the SCAMA management goal, which seeks to "[maintain] safe-yield conditions to prevent local water tables from experiencing long-term declines."
- R12-15-716(E)(3)(a) The one standard deviation below the historic average will allow deviations that are in excess of the AMA management goal. Additionally allowing deviations of up to 12 consecutive months or 10% of the months in a simulation could have drastic impacts on riparian areas.
- It would be helpful to have a number of monitoring wells instrumented with continuous recording devices to monitor on a daily or hourly basis. It would also be helpful to install monitor wells in riparian areas to improve model accuracy and resolution, in regard to likely impacts of withdrawals in the Santa Cruz River riparian corridor.
- The rules disincentivize the acquisition of effluent from the NIWTP, either as necessary to maintain the existing riparian areas or simply to sustain existing water uses, since the rules allow new proposed uses to effectively "borrow" against this effluent buffer without incurring any obligation to secure it.
- Further refinement of the model in regard to being able to distinguish riparian areas, ET rates and relationships between groundwater levels in the floodplain aquifer is recommended.
- The allowable variation in static water levels is too large. Research demonstrates that significant interruptions in groundwater supply, i.e., more than 2-3 months, will stress and eventually extirpate riparian vegetation. Unfortunately the proposed points of regulatory compliance will not prevent this from occurring.
- A quick survey demonstrates that even the Department's proposed average historic depth-to-static water would be insufficient to prevent deterioration of some riparian areas.

Topic	Commenter	Comment
Statistics		

Carlos Ronstadt, Snell & Wilmer

- The commentator notes that the Department has recognized that the data used in the model (available water level data) have a sampling bias, insomuch as the data points were not randomly sampled. The commentator concludes that the data cannot be used in a statistically valid manner.
- The Commentator perceives flaws in the modeling. As such the model should not be used. No other area in the state relies upon such a model, and standard numerical modeling should be used.
- The Commentator implies that the use of numerical models such as MODFLOW are scientifically valid due to a greater volume of documentation while the modeling method of Poisson stochastic process used by the Department is somehow less valid due to less available documentation.
- The proposed rule will require a complex statistical analysis referred in the draft language as "stochastic modeling technique." This term is not defined within the rule.
- The commentator notes that the Department has recognized the fact that the existing water level data may not represent the true average water level for all areas of the AMA. The commentator states that there is not enough data to use the statistical method, and that the Department should wait to implement the rules until at least 30 years of data are available.

Jim Davis, Errol L. Montgomery & Associates

- One standard deviation in water level may not be the appropriate way to determine acceptability of groundwater impact. Areas with larger fluctuation, such as those near the river and areas of heavy pumping would allow more impact.
- The definition for water level monitoring location seems unnecessarily restrictive to the Department's and USGS' data. The rules should allow for the use of other data sources such as other government agencies, private water companies etc. The rules should allow for the addition of supplemental data.
- Requiring 100 model simulations seems excessive.

Lee Storey, Ballard Spahr Andrews & Ingersoll, LLP

- The commentator observes that the allowable exceedence beyond one standard deviation is 10% of the total runs of the model. The Commentator further observes that this results in the proposed rule requiring proof of a non-consecutive 1,000-year assured water supply.
- The commentator suggests a deviation of more than 50% should be considered long-term.
- The commentator raised several concerns regarding the use of the historic water level data, specifically, the lack of data available to the Department. In addition, the available data may be sparsely or infrequently collected.
- The standard deviation is a data tool and should not be used to measure the hydrologic conditions. This tool is acceptable as a measure of the available data, but should not be used due to the lack of data. There should be at least 30 years of data to support the use of such a data tool. The use of this method is an arbitrary measure of the proposed use vs. the goal of the AMA.
- A 10% deviation does not equate to a "long term" decline.
- The commentator expressed concerns that by requiring the multiple runs of the 100-year model simulation, the Department is requiring the proof of a 10,000 year assured water supply (100 runs of a 100-year model), thus exceeding the assured water supply requirement as outlined under statute.
- The 10% deviation does not reflect the 30-year history of effluent discharge into the Santa Cruz River.

Topic	Commenter	Comment
Statistics		

Sonoran Institute

- The use of both pre- and post-effluent water levels has two important consequences. Generally the depth to static water level is deeper and the standard deviation is generally artificially inflated beyond the value that would be associated with either a pre- or post-effluent data set. This greater standard deviation also deepens the regulatory water table threshold significantly beyond what would be expected from use of either a pre- or post effluent data set in isolation.
- R12-15-716(E)(3)(b) does not ensure that groundwater discharge will continue at anywhere near current levels, since it only requires models to demonstrate that discharges are greater than zero, and only requires models to demonstrate that this state be demonstrated in one month out of the last 10 years of the projection period, and in only 90% of the modeled scenarios. This does not function to protect current groundwater discharges to the floodplain aquifer, and is fundamentally inconsistent with the SCAMA management goal.
- Use of pre- and post-effluent water levels creates much larger acceptable variations from current levels than would be expected using either dataset in isolation. The habitat concerns created by this methodology are exacerbated by the fact that deviations even below the standard deviation are permitted for periods up to 12 consecutive months or 10% on the months in a series of simulations. The proposed rule stretches any reasonable interpretation of what constitutes "prevention of long-term declines."

Surface Water Rights

Carlos Ronstadt, Snell & Wilmer

- There needs to be a clear mechanism for property owners with appurtenant surface water rights to extinguish those rights and allow the use of an extinguishment credit to support development.
- The proposed rules do not take into account the downstream surface water user that may have more senior water right.

Hough Holub, Attorney at Law

- Generally supportive. The commentator cautions that when the Legislature created the AMA they wanted a conjunctive management of the surface water and groundwater systems, but the Legislature did not create a new surface water management legal system. The commentator also observes that surface water rights have both a relative priority (some are senior some are junior) and do not necessarily correlate to the actual physical availability, which can fluctuate based upon actual flows, dependant upon rainfall. The commentator asks how to deal with the variable supply of surface water for assured water supply purposes, and suggests that the 'extra' surface water right that might exist in a right that does not meet assured water supply standards be voluntarily transferred to third party instream right holders such as State Parks, or conservation entities like trusts, National Park Service, etc.

Jim Davis, Errol L. Montgomery & Associates

- The commentator expressed agreement that use of dual filed rights should be limited if the source water is the same for both types of rights. However, Commentator felt it would be inappropriate to limit the use of multiple rights if those rights were reflective of separate water sources.

Lee Storey, Ballard Spahr Andrews & Ingersoll, LLP

- The rules must not infringe upon private property rights. While the commentator agrees with the intended goal of preventing "double dipping," the commentator questions the methodology, as it may infringe upon private property rights. The commentator also questions whether the rights in question are truly dual filed or is this simply an assumption. The Commentator also questions what happens to the remaining rights or claim after the smaller of the two rights is used for assured water supply.
- The rules should recognize the fundamental right of surface water users to use the entire entitlement of a priority basis. The commentator believes the rules as drafted are contrary to the SCAMA enabling statutes in that the draft rules modify the fundamental characteristics of surface water rights in the AMA. The commentator believes the AWS rules cannot prevent or limit the use of surface water rights by implementation of the goal of the active management area.
- The commentator observes that hydrologic fluctuations do occur in the system, and that these fluctuations may be of durations longer than one year. The commentator questions how these multi-year fluctuations are reflected in the model. The commentator suggests that the Department make a determination of what "long-term" is so that it does not limit the use of surface water rights that are converted to assured water supply purposes.
- The commentator is confused by the definition of "projected net monthly groundwater discharge." It is unclear how applicants can determine net monthly discharge when sources of water are not distinguished as surface water or groundwater in the proposed rules.

Sherry Sass, Friends of the Santa Cruz River

- Supportive of the rules as proposed. The rules recognize the groundwater and surface water interaction in the AMA, riparian demand and provides for proper drought response. The commenter did raise concern that a dual right holder in the AMA may be able to separate those rights and essentially "double dip" increasing the demands and out stripping supplies.